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A COMMAND, CONTROL, AND COMMUNICATIONS COMMAND POST IN SPACE:
A FURTHER STEP FOR NUCLEAR DETERRENCE
AND PRESERVING NATIONAL SECURITY

LIEUTENANT COLONEL HARRY D. RADUEGE, JR

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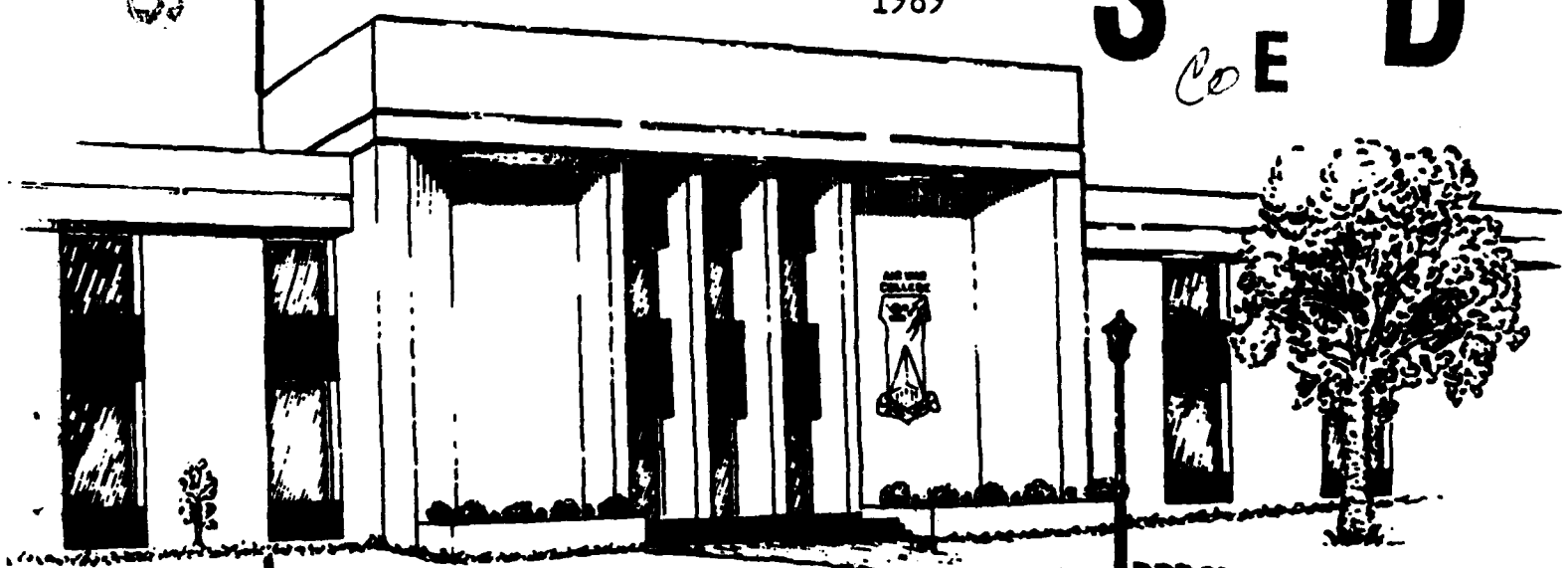

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A COMMAND, CONTROL, AND COMMUNICATIONS COMMAND POST IN SPACE: A FURTHER STEP FOR NUCLEAR DETERRENCE AND PRESERVING NATIONAL SECURITY

by

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EXECUTIVE SUMMARY

TITLE: A Command, Control, and Communications Command Post in Space: A Further Step for Nuclear Deterrence and Preserving National Security

AUTHOR: Harry D. Raduege, Jr., Lieutenant Colonel, USAF

A U.S. congressman thinks U.S. forces are at the brink of being out of control from a loss of communications. This paper describes the critical need for survivable national-level command, control, and communications (C^3). Brief description of the threat the U.S. faces from the Soviet Union with particular emphasis on growing space-based capabilities. General vulnerabilities of the U.S. National Command Authorities and supporting systems are described. Attributes of space-based command, communications, and control are compared to current land, sea, and air capabilities. Developing a permanently manned C^3 command post in space would benefit U.S. security strategy through significant enhancements to nuclear deterrence and the political, economic, psychological, and military instruments of national power.

BIOGRAPHICAL SKETCH

Lieutenant Colonel Harry D. Raduege, Jr. (M.S. in Business Management, Troy State University, and M.S. in Telecommunications Management, University of Southern Mississippi) has worked in the command, control, and communications (C^3) area for 19 years. His interest in space activity intensified in 1988, while he was the commander of a communications unit supporting a space related activity in Turkey. From 1984 to 1988, he was an Air Force Space Command division chief and director for C^3 engineering supporting the North American Aerospace Defense Command, the Aerospace Defense Command, the United States Space Command, the Air Force Space Command, and the Space Communications Division in Colorado Springs, Colorado. He is a graduate of the USAF Communications-Electronics Staff Officer Course, Squadron Officer School, Air Command and Staff College, Armed Forces Staff College, the National Security Management Course, and the Air War College class of 1989.

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CHAPTER I

INTRODUCTION

> Space as a medium and space-based military support systems, in particular, are terribly important, if not vital, to our national security and well-being as a nation.
>
> Donald C. Latham (1:46)

During the summer of 1988, a United States congressman stated that he " . . . can easily imagine a[n] . . . environment of serious threat where we lose most of our comm . . . overnight and have no effective counter response." The congressman continued his apocalyptic vision with an even more sobering pronouncement: " . . . U.S. forces are at the brink of being out of control".

This congressman's statement and its implications must concern everyone interested in the viability of the command, control, and communications (C^3) used by this nation in supporting our National Command Authorities (NCA) and national security objectives. Unequivocally, C^3 systems supporting the NCA must be capable of functioning continually and surviving any threat in providing the critical link between our NCA and the United States military forces worldwide.

Today, our military forces are controlled via a complex infrastructure of C^3 systems. Since these systems are ultimately Earth-based and their technologies

are quickly aging, they are growing increasingly vulnerable to degradation and destruction when needed most--in time of war or national emergency. Space-based systems have come of age. They must now be more seriously considered for an increasing role in preserving our national security and well-being as a nation.

The threat to the United States from its principal adversary, the Soviet Union, has continued to grow. Even with a severely depressed economy, the Soviets have continued to develop impressive space-based capabilities that could threaten the national security of the United States.

Space as a medium and space-based military support systems hold great potential in proviving the United States and its NCA leadership with survivable C^3 systems. If we are to realize that potential, however, we need to look toward space today with a vision of tomorrow.

Through a national security strategy of manning a C^3 command post in space with designated NCA representatives, United States leadership can always be assured and national-level C^3 survivability can be greatly enhanced. This new capability has far reaching implications. This paper will examine how a C^3 command

post in space could benefit United States security through significant enhancements to nuclear deterrence and to the political, economic, psychological, and military instruments of national power.

CHAPTER II

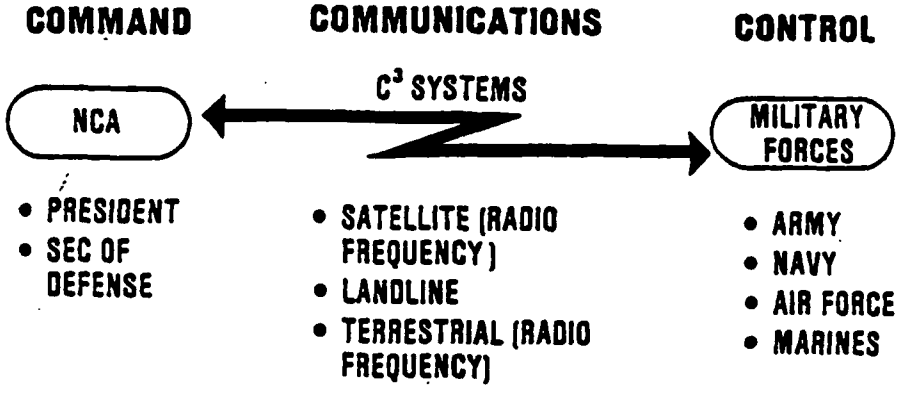
C^3 FOR NATIONAL SECURITY

To a large degree, the security of the United States is ensured by its military forces. These forces are located throughout the world on land, at sea, and in the air. Because of the awesome power these forces possess, they are at all times under absolute civilian control, as provided by the NCA.

A Fundamental Objective

The United States has a fundamental objective for controlling its military forces. This objective can be illustrated with a model consisting of three basic elements (see Figure 1). First, the NCA--defined as the President and the Secretary of Defense--are the command authorities over all United States military forces. Second, various C^3 systems allow the NCA to communicate their desires worldwide and receive feedback. Third, United States military forces are controlled by NCA directions received via C^3 systems.

Although not specifically defined in the "DOD Dictionary of Military and Associated Terms" (JCS Publication 1), civilian and military leaders in many nations know the acronym "C^3" to mean command, control, and communications. In light of the model I have used in



NATIONAL-LEVEL "COMMAND, COMMUNICATIONS, & CONTROL"

FIGURE 1

Figure 1 and because "C^3" lacks an official Department of Defense definition, I have taken the liberty of presenting "C^3" an alternative way. Perhaps a reader not as familiar with the traditional implications of "C^3" can more easily envision its critical role by thinking of C^3 as "command, communications, and control" where, descriptively, communications are required "between" command authority and the military forces they control.

Throughout the remainder of this paper, you can think of C^3 either in traditional terms or in my more literal sense as "command, communications, and control." Either way, C^3 is a critical element in preserving United States national security.

What Are We Up Against?

> Clearly, it is not the militarization of space we must fear (that took place 30 years ago) but the *dominance* of space by forces hostile to liberty.
> Casper Weinberger (2:43)

When Mikhail Gorbachev, the Soviet General Secretary, said "We do not intend to relax our efforts and lose our vanguard positions in the conquest of space," (3:B1) he openly confirmed Soviet policy aimed at achieving dominance in space. The Soviet budget supports these intentions. Although precise figures on Soviet

spending in space are not available, United States intelligence agencies estimate that the Soviets annually spend a minimum of fifty percent more than the United States (4:82).

One of the most significant Soviet achievements in space is their Mir space station. The Mir, with its six docking ports, offers the Soviets great versatility in constructing what probably will become the world's first permanently manned space station (5:63). General John Piotrowski, the Commander in Chief of the United States Space Command, notes that Mir's six docking ports ". . . could be used to increase the military capability of the space station" (6:60). Certainly, with their emphasis in specific space related activities to date, the Soviets could be developing a manned, space-based capability for any, or all, of the following missions:

1. Battle management and C^3 for space control operations.

2. Integration of their anti-satellite weapons and surveillance capabilities in applying space control options.

3. Operation of space-based ballistic missile defense systems together with battle management and C^3 support systems.

4. Operation of sophisticated surveillance,

tracking, and targeting systems.

Even President John Kennedy had the foresight more than 25 years ago to warn us that "If the Soviets control space, they can control the Earth, as in the past centuries the nations that controlled the seas dominated the continents" (7:61).

Life in space is not new for the Soviets. Their engineers routinely planned regular three-month "tours of duty" aboard their Salyut 7 space station in preparation for extended manned space operations (8:157). The Soviets seem determined to maintain a permanent manned presence in space. In fact, Lieutenant General Leonard Perroots, the Director of the Defense Intelligence Agency, laments "I don't think we'll ever see another day when there will not be a cosmonaut in space" (9:2). The message for Americans seems clear: the Soviets have "taken the high ground" and will be permanently orbiting above our national leaders' heads and our military forces from now on.

In these days of a weak Soviet economy, it seems bizarre that they are investing so much of their limited funds in maintaining a permanent manned presence in space--but, they are. One must wonder what manned mission in space is so important that it is allowed to predominate so much of the resources of a failing Soviet economy. Could the Soviets already be building a

survivable outpost in space to control and support their space-based and terrestrial military forces? This could be a natural progression in capability since they have clearly stated a national policy designed toward maintaining their vanguard position in space.

On Earth, the Soviets have taken extraordinary action to protect their national leaders from enemy missile and bomber attack. Again, by dedicating huge sums of money to the task, the Soviets have built an extensive deep underground command center environment (10:75) that is unparalleled in the world. Although their national leaders will be afforded greater physical protection in their isolated underground locations, the inherent weakness they must still endure is not being able to actively communicate with and, thus, control their military forces. Without control, military actions placed in effect may become irreversible and impossible to terminate. This reality provides a fundamental consideration for both sides to ponder. C^3 systems needed to control escalation and terminate nuclear war must be in place, functional, and survivable throughout pre-, trans-, and post-attack scenarios involving all levels of conflict. Otherwise, the ability to control military forces or terminate a conflict may quickly become an impossibility.

So, what is the United States up against? We are up against a formidable opponent who is thinking and investing in ways of ensuring that his civilian and military leaders can survive a nuclear war. Although underground command centers provide additional physical protection, they hamper effective C^3 with the military forces and are growing increasingly vulnerable to nuclear weapons attack. Both the Americans and the Soviets realize that. Thus, the question concerning future Soviet space capability becomes: What functions are the Soviets planning for their manned space station to perform during wartime?

Who's In Charge?

> Another exercise involved a hypothetical Russian attack on "critical C^3I nodes." A combination of sabotage and missile attacks on Washington and on U.S. early-warning systems in effect "decapitated" the U.S. government. The Minutemen were all safe in their silos, the submarines were hidden at sea, the bomber fleet safely got away--but the President was "dead," no one was sure who had taken his place, the commanders in chief couldn't talk to each other and didn't know what was going on. One way of describing the result would have been to say that Russia won the war (11:95).

An interesting scenario: but, could that really happen? William F. Buckley reminds us of the significant challenge now facing the United States:

> . . . by 1995, the Soviets will have completed deployment of their fifth-generation ICBM arsenal and will have completed their nationwide ABM defense. At that time, they will have clear military superiority, because they will have the ability to disarm the U.S. by destroying the C^2 network for our nuclear forces . . .(12:BT).

Mr. Buckley goes into greater detail by pointing out that the accuracy of Soviet warheads means that the hundred-odd most important targets in the United States, our command and control centers, could be destroyed with relatively small nuclear weapons (13:B7). By referring again to Figure 1, the United States is vulnerable to losing the first two-thirds of the basic elements required for preserving our national security: the NCA and their C^3 systems. And, loss of either represents total loss of NCA control. If Mr. Buckley is correct, then the apocalyptic vision described by a United States congressman referred to earlier may also be true--United States forces could be at the brink of being out of control.

Other writers specifically caution us about the current vulnerability of our NCA leadership. One author warns that NCA successors should be designated as a hedge against the loss of the NCA. This same author notes that the major problem and key requirement is to protect the NCA and their successors in a command center capable of

surviving and functioning through all phases of a strategic nuclear war (14:40).

The United States must also have a way of determining whether a successor authority is, in fact, the most senior surviving person in the successor chain. In satisfying this requirement, a survivable C^3 system is mandatory. Today, however, supporting communications would be limited, at best. "The dozen or so communications networks used by federal agencies and departments are not likely to survive" a nuclear attack (15:42).

The critical requirement for a survivable command post and C^3 system for United States national security cannot be overemphasized. In view of present vulnerabilities, the United States needs an NCA survival strategy with much higher assurances for survival than are presently apparent. The United States should <u>never</u> have to ask "Who's in Charge?" and either not get an answer or be faced with too many time consuming and false "I am" responses.

CHAPTER III

CURRENT SOLUTIONS

Earlier, Figure 1 was used to show how the United States ties three basic elements--the NCA, C^3, and military forces--together in supporting our national security objectives. I referred to this process as "command, communications, and control" because of the sequential steps taken in the process. During peacetime, all three of these basic elements function very reliably. During wartime conditions, however, the reliability of these basic elements will be stressed to the maximum. Current and emerging Soviet capabilities, described earlier, and the ravages of nuclear war pose formidable risks to the survivability of our NCA, C^3 systems, and military forces.

Land, Sea, and Air Protection

The United States continually strives to protect its NCA, C^3, and military force effectiveness throughout all scenarios--from peacetime through global nuclear war. When this capability can be assured, we refer to the protected elements as being "survivable." Today, the survivability of our national "command, communications, and control" process is attempted primarily by using land, sea, and air capabilities (see Figure 2).

The United States tries to ensure that its

- AIRBORNE COMMAND POST

- FREQUENCY HOPPING
- SPREAD SPECTRUM
- ANTI-JAM
- ELECTROMAGNETIC PULSE (EMP) PROTECTION
- DIFFERENT SYSTEMS/ FREQUENCIES
- REDUNDANCY

- HARDENED UNDERGROUND SILOS
- SUBMARINES
- AIRCRAFT

"COMMAND, COMMUNICATIONS & CONTROL"
SURVIVABILITY & PROTECTION (TRIAD EXAMPLE)

FIGURE 2

command element--the NCA--is made survivable by rushing them via helicopter from the vulnerable Washington D.C. area to less vulnerable airborne command posts.

The Department of Defense attempts to provide the NCA with survivable communications through various technologies: by "maneuvering" signals (frequency hopping); by hidden, or "stealth", signals (spread spectrum); by anti-jamming techniques; by providing electromagnetic pulse (EMP) protection; by using different systems and frequencies; and by using signal path redundancy.

Finally, as an example, the United States attempts to protect and control its strategic nuclear forces, the TRIAD, by placing the intercontinental ballistic missiles (ICBMs) in hardened underground silos, by hiding submarine launched ballistic missiles under the sea, and by launching the strategic bombers following warning.

And So We Age and Grow Vulnerable

> Lieutenant General Scowcroft noted, " There's a real dilemma here that we haven't sorted out," in that the use of "controlled nuclear options" to force concessions from the Soviets "presume[s] communication with the Soviet Union. And yet, from a military point of view, one of the most efficient kinds of attack is against leadership and command and control systems . . . . This is a dilemma that, I think, we still have not completely come to grips with."
>
> Daniel Ford (16:242)

The dilemma presented by General Brent Scowcroft

questions whether a nations leadership and its control over its military forces will survive an attack. In actuality, our NCA, C^3, and military force elements have varying degrees of survivability.

NCA survivability is very much in question. If Washington D.C. was attacked with a submarine-launched missile, the President might have six or seven minutes to escape by helicopter (17:95). A torpedo, cruise missile, or satchel bomb could allow the NCA even less time for escape. Proponents of the NCA helicopter-to-airborne command post survival plan think that there is adequate time to get the NCA leadership out of Washington; skeptics do not think so. If the NCA successfully gets airborne, however, opponents still question the amount of time that they will be able to safely and functionally remain airborne.

The survivability of various communications systems supporting the NCA is also regularly discussed. To begin, the Washington-to-Moscow Hot Line installed at the request of President Kennedy following the Cuban Missile Crisis of 1962 is the only direct, government-to-government communications link between the leadership in the United States and the Soviet Union. Because it is not a survivable link, however, it will not be available for general nuclear war communications

(18:44). Other highly survivable communications will be available to the NCA once they get airborne in the flying command post. However, various authors even question the degree of survivability that these systems will offer. For example, one critic notes that "Neither existing nor planned systems can ensure the availability of a war termination capability, because no known system is certain to survive a nuclear war" (19:44). Due to the destructive power and improving accuracy of nuclear weapons, no fixed, land-based communications system will ever be considered truly survivable; if a blast doesn't physically disable the system, then EMP effects most assuredly will. Providing and maintaining EMP protection for C^3 systems is a complex science that requires constant attention. EMP protected C^3 systems notoriously grow vulnerable over time, unless relentlessly maintained.

United States military unified and specified (U & S) commanders (four-star generals or admirals) receive and then pass NCA directions to the military forces. Our U & S commanders also have various means of protecting themselves and communicating with their forces. U & S commanders try to survive by using underground, land mobile, and airborne command posts. Many of these

facilities have grown very old. As a result, age and continued Soviet technological advances challenge their physical survivability more and more with passing time.

Previously, underground command posts were considered very survivable; now they are not. Although airborne and mobile command posts currently offer the most survivability, they too will become increasingly vulnerable as the Soviets continue to improve the surgical accuracies of their surveillance, tracking, and nuclear delivery systems. Additionally, if one considers only a 10 day period of nuclear exchange, secondary radiation effects could produce lethal levels of fallout that would neutralize critical ground units. Mobile command centers could cease to function and airborne command posts, lacking ground support or experiencing airborne malfunction, could quickly lose their effectiveness.

The requirement for survivable NCA, C^3, and military forces is paramount for fulfilling a key national security objective--maintaining nuclear deterrence. It is imperative that the NCA be able to communicate with United States military forces under all conditions. If we cannot assure this capability, we will have to concede to the United States congressman quoted earlier in his belief that ". . . U.S. forces are at the brink of being out of control".

Looking Ahead

The United States faces formidable challenges in ensuring a survivable NCA, C^3, and military force posture. Some theorists think the problem is too big to be solved. If that is true, many planners may be guilty of overcoming their fears simply by ignoring reality and "keeping their fingers crossed."

Historically, instead of just "hoping for the best," however, America has solved some of its toughest problems with technological innovation. Up to this point, the United States has looked primarily to the land, to the sea, and into the air for answers in solving its "command, communications, and control" survivability problems. If we turn our minds to the possibilities offered in space, we may now find new answers to our evolving problems.

CHAPTER IV

ENHANCING DETERRENCE AND NATIONAL SECURITY

> In the next century, leadership on Earth will come to the nation that shows the greatest leadership in space. It is mankind's manifest destiny to bring our humanity into space to colonize this galaxy. . . . In the limitless reaches of space, we will find liberation from tyranny, from scarcity, from ignorance, and from war. . . . We will find the means to protect this Earth. . . . This is our mission.
> President Ronald Reagan (20:3)

These words, by the President of the United States, recognize the importance of finding new ways of utilizing man in space to protect the Earth. The President's challenge lays substantial groundwork for innovative thought.

As Figure 3 shows, the medium of space offers a minimum of four important attributes for "command, communications, and control" survival and effectiveness: the assurance of being "in place" and functional prior to attack; the ability to "hide" (and survive); the ability to maintain effective, high capacity communications with ones military forces; and the ability to perform surveillance of ones outside surroundings. As indicated, the land, sea, and air mediums fall short in ensuring one or more of these important capabilities.

Space offers significant advantages over fixed, land-based command posts and C^3 centers. In reality,

ATTRIBUTES / MEDIUM	ASSURANCE OF "IN PLACE" & FUNCTIONAL AT "PRE-ATTACK"	ABILITY TO HIDE & SURVIVE	MAINTAIN EFFECTIVE HIGH CAP. COMM.	ABILITY TO SURVEIL OUTSIDE
LAND				
UNDERGROUND	YES	NO	NO	NO
MOBILE	NO	MAYBE	NO	YES
SEA				
SURFACE	YES	NO	NO	YES
SUBSURFACE	YES	YES	NO	NO
AIR	YES	MAYBE	MAYBE	YES
SPACE	YES	YES	YES	YES

ATTRIBUTES OF SPACE FOR
"COMMAND, COMMUNICATIONS, & CONTROL"
SURVIVAL & EFFECTIVENESS

FIGURE 3

with today's missile accuracies, any fixed, land-based facility is extremely vulnerable to attack and cannot be considered survivable. Land mobile caravans are much more survivable than fixed facilities but, without adequate warning, they cannot be relied on to be "in place" and functional before a preemptive nuclear attack commences. Additionally, their ability to hide, survive, and provide effective, high capacity pre-, trans-, and post-attack communications connectivity cannot be assured.

After fixed, land-based facilities became so vulnerable, the United States began to rely more heavily on the sea and air for "command, communications, and control" survivability and effectiveness. For over 28 years, the United States has kept military persons assigned full-time at sea and in the air in ensuring our nations security. Most visible is United States sea power which is projected worldwide both on and under the surface of the oceans. Military persons routinely spend six month tours of duty at sea. Perhaps less known to the public is the Strategic Air Command's flying command post aircraft "Looking Glass" which has remained constantly airborne with rotating military crews serving eight hour tours of duty since February 3, 1961. Without a doubt, full-time United States military presence at sea and in the air has helped ensure the integrity of our

national security strategy.

As with the sea and air, a full-time manned presence in space is feasible and offers great potential as a future step to preserving national security. But, what can space, the fourth medium offer? General Robert Herres, while serving as the Commander in Chief of the United States Space Command, pointed out that space--like the sea and the atmosphere--is merely another medium which human technology has provided the means to transit, to use, and to exploit (21).

Just as we have people permanently assigned on land, at sea, and in the air, we must also seriously consider permanent manned operations in space that can enhance United States national security. Innovation in space today will provide the means for security on Earth tomorrow.

A Vision Worth Considering

A C^3 command post in space, which I will refer to from now on as a C^3CPS, offers a vision worth considering for preserving national security. United States "command, communications, and control" of its military forces, described in Figure 2, could be improved by permanently assigning an NCA representative and supporting C^3 systems to a C^3CPS. The NCA representative

would be assisted by a seven person operations crew consisting of individuals from the Army, the Navy, the North American Aerospace Defense Command, the Strategic Air Command, the United States Space Command, the Federal Emergency Management Agency, and, when established, the Ballistic Missile Defense organization. C^3 technicians from the Defense Communications Agency and Air Force Communications Command would support the operations crew. The NCA representative would be the commander of the C^3CPS. In effect, the C^3CPS would function as a national-level "Looking Glass" asset. The station would not contain offensive weapons. It would exist as a nonhostile and nonprovocative space system.

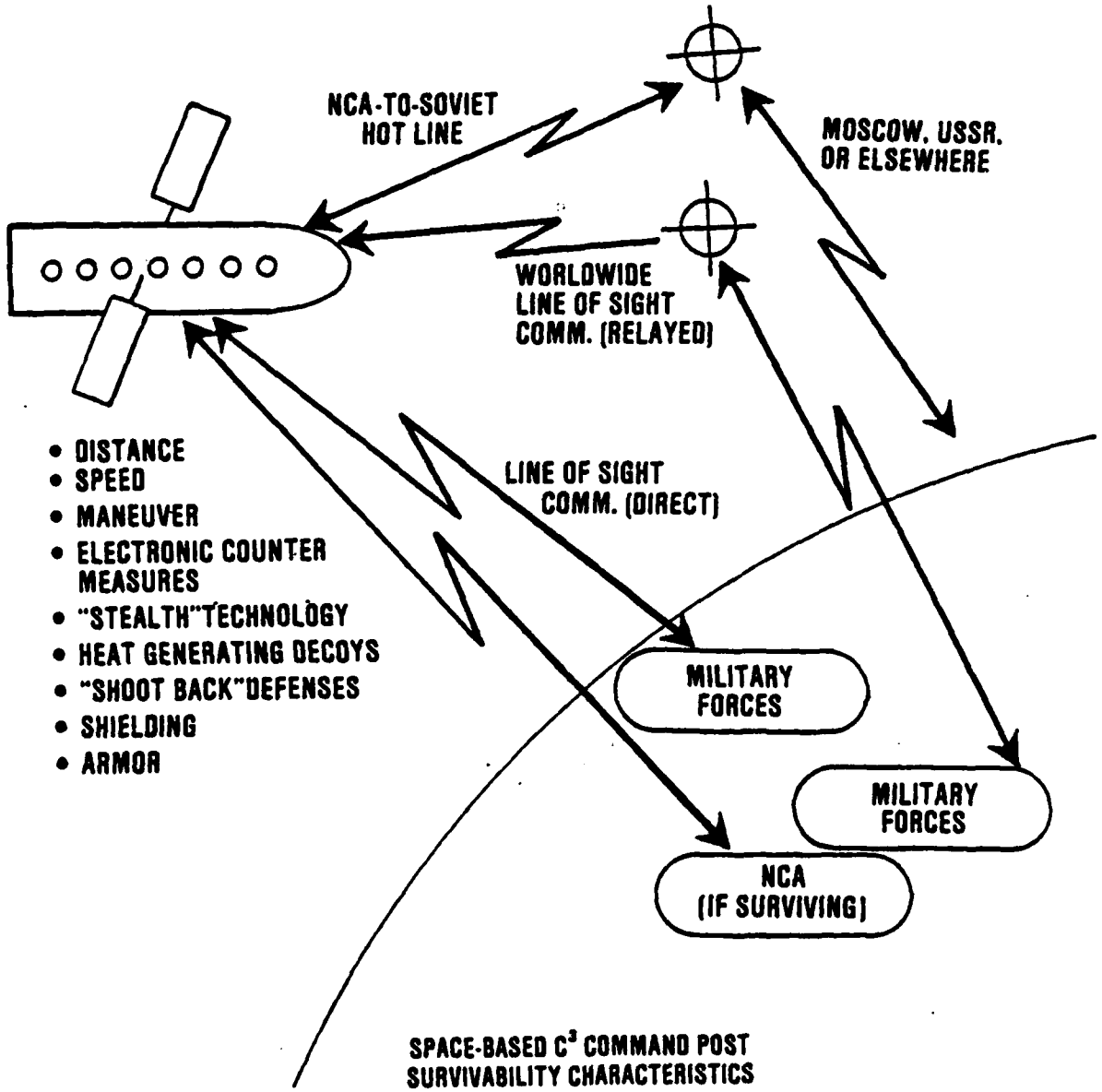
Crews would be periodically rotated to and from the orbiting C^3CPS using a space transportation system: either the NASA Space Shuttle or the National Aerospace Plane, when deployed. C^3CPS crews would serve tours of duty in space similar to those presently performed at sea by the Navy or planned for the permanently manned space station "Freedom." Currently, "Freedom" crews are expected to spend 90-120 day tours of duty in space beginning in 1996 or 1997 (22:79).

A Giant Step For Survivability

Survivability is a critical part in preserving United States national security. President Reagan recognized this point in his new space policy where he calls for the development of capabilities to ensure the survivability and endurance of national security spacecraft (23:25).

As described earlier and with the aid of Figure 1, three key elements that need to be survivable are the NCA, their C^3, and the military forces. By positioning an NCA representative, various supporting C^3 systems, and an advisory military crew into an orbiting C^3CPS, overall survivability of the "command, communications, and control" model in Figure 2 can be improved considerably over present capabilities.

The C^3CPS will offer more NCA survivability than any existing or planned system (see Figure 4). The C^3CPS achieves its survivability through several means. First, the inherent capabilities of distance and speed of an Earth-orbiting spacecraft provide a baseline of survivability. At distances that could range from 300 miles (low Earth orbit) to 22,000 miles (geosynchronous orbit) from any point on the Earth and traveling at speeds up to 18,000 miles per hour, the C^3CPS would be a



SPACE-BASED C^3 COMMAND POST
SURVIVABILITY CHARACTERISTICS

FIGURE 4

tough target if it possessed only these inherent capabilities. In making the C^3CPS truly survivable, however, we would add applied survivability features. These would include maneuver, electronic counter measures, stealth technology, heat generating decoys, "shoot-back" defenses, shielding, and armor capabilities. A full complement of these protective features would produce a truly survivable United States command post.

C^3 supporting the NCA representative would be more survivable since it would be space-based within the C^3CPS and not functionally dependent on vulnerable Earth-based systems. As shown in Figure 4, reliable line of sight (LOS) communications between the NCA representative and United States military forces worldwide would be simplified. This is a significant benefit since there is no substitute for a strategic C^3 system with LOS capabilities and man in control. Additionally, a more survivable NCA-to-Soviet Union Hot Line would be installed and available for negotiation and conflict termination throughout all levels of conflict. The C^3CPS provides a flexible C^3 system capable of "finding" the Soviet leadership whether they have remained in Moscow or, more likely, relocated to another city or country.

By ensuring the survivability of national "command, communications, and control," the United States can help ensure that its forces are never out of NCA control and that a capability to negotiate is permanently maintained.

CHAPTER V

THE INSTRUMENTS OF NATIONAL POWER

The United States is a global superpower. Its power is recognized and projected with full-time American presence on land, at sea, and in the air. If we want to maintain superpower status in space, however, the United States must establish a permanent manned presence. Up to this point, machines or occasional manned flights into space have been used very successfully for support, exploration, and experimentation. We have now come to a point in our technological maturity when a permanent presence in space can help secure our full-time national objectives. NCA-designated successor leadership assigned to a permanent, meaningful mission in space would confirm what many already think of as a new fundamental truth; space is not just an adventure--it's a job!

A C^3CPS represents a vision of national security and leadership in space for the future. Its concept represents a significant change to United States security strategy and a substantial investment. In considering its viability then, we must evaluate the C^3CPS concept in view of its effect on the political, economic, pyschological, and military instruments of United States power.

The Political Instrument

> The burden of my message then is that we should think seriously about the relationship of command and control to strategy, both cause and effect. We must insure that that which we do contributes toward the goal of a realistic flexible response strategy designed to prevent war. Deterrence has for twenty-five years prevented nuclear war. It will for future generations if we are wise.
>
> Lee M. Paschall (24:27)

The greatest benefit to be derived from deploying a C^3CPS would be its positive contribution to nuclear deterrence--the cornerstone of United States defense policy (25:25). The strategy of deterrence is, perhaps, the only way to keep Americans both alive and free. General Russell Dougherty points out that there are two essential elements of a successful strategy of deterrence. First, the United States must acquire adequate military capability; Second, we must develop a national consensus of will that our military capability would be used, if need be, to preserve our freedoms. Colonel "Abe" Lincoln of West Point used to say that a nation's capability times its national will equals deterrence. He emphasized that this is a proposition of multiplication, not addition, for if either capability or will is zero, then the product--deterrence--is also zero. Reliable deterrence is only achieved when potential adversaries perceive the multiplying effect of our capability and will (26:7). A C^3CPS would significantly

add to United States political and military capability, would demonstrate American will for controlling our military forces during peacetime or war, and would maintain a capability for terminating a conflict as rapidly as possible.

Should our NCA not be able to function for a period of time or permanently, a C^3CPS would assure this nation of a properly designated NCA successor and advisory staff. The NCA representative could provide leadership for political cohesion, designated command of the military forces, and authoritative negotiating power required for ending a conflict.

The C^3CPS will provide the United States with technological advances that will correspond to Soviet efforts in building their 12-person, permanently manned space station (27:158) and their deep underground command center network. With the Soviets concentrating so heavily on protecting their national civilian and military leaders, the United States must maintain nuclear deterrent parity by improving the survivability and effectiveness of our own national "command, communications, and control."

A survivable NCA structure deployed in space would send a clear signal of United States capability and

resolve to the rest of the world. This "forward deployment" of national leadership into a survivable outpost in space would contribute daily to improved nuclear deterrence.

The Economic Instrument

Secretary of Defense Casper Weinberger reminded us that "Budget deficits and domestic program cuts can be rectified; but security shortfalls carry the risk of irreversible losses" (28:62). The need for providing this nation with survivable NCA leadership and C^3 systems must be seriously considered and articulated. The C^3CPS concept offers a strategy for meeting that need. Although advances that aid national security do not necessarily have to be cost beneficial, a C^3CPS does provide several significant cost considerations. First, it could replace various force survival strategies and techniques currently used in the increasingly nonsurvivable mediums of land, sea, and air. Second, a C^3CPS would add significant new capability without being manpower intensive--12 person crews from present organizational structures would also perform space duty.

If the United States validates the need for the C^3CPS concept but does not want to foot the bill alone, a

coalition funding and support arrangement--such as an agreement with NATO--could be considered. A C^3CPS could be funded similar to the way the European Space Agency will invest more than two billion dollars in jointly funding the "Freedom" space station effort (29:5).

Americans are extremely fortunate. Whenever there has been a meaningful objective in the past, we have always found the resources to support it. The C^3CPS provides a vision for improved nuclear deterrence. Should deterrence fail, however, a C^3CPS would provide a survivable platform for reestablishing government communications and for terminating the conflict at the soonest possible time. Deterrence and prompt resolution of differences are very cost effective; they could save millions of lives and trillions of dollars in assets. National security advancements that have great potential should always be considered affordable options and a meaningful investment.

The Psychological Instrument

Public opinion is a strong national asset that influences national strategies. The psychological instrument of national power includes a deep underlying American desire for security and superiority in the world.

A C^3CPS would instill new confidence in the minds of Americans for our nation's security. Although not a topic of daily conversation, research indicates that Americans are interested and concerned about their security. This is attested to by the fact that the highest-rated made-for-television movie ever was *The Day After*, a 1983 drama about the effects of nuclear war involving the United States (30:1D). Suprisingly perhaps, this indicates that national security is "at the top of the charts" in American interests.

Americans permanently orbiting the Earth and ensuring our security as a nation would have a positive psychological affect on America's citizens. That vision, however, needs to be carefully explained and articulated to the American public. Their opinions often influence national security strategy; lacking public support, best laid plans may not get off the ground.

The Military Instrument

The military instrument of national power would realize significant benefit from deploying a C^3CPS system. As explained earlier, the C^3CPS would ensure NCA and space-based C^3 survivability. This would significantly improve the probability that United States military forces would never be without properly delegated

national-level command direction. Clearly, the survivability features and benefits of the C^3CPS would contribute to the United States' number one military priority--nuclear deterrence. Should deterrence fail, however, a C^3CPS would provide a survivable platform for prosecuting the war, for terminating the conflict, and for reconstituting our military forces.

Additional military benefits from building a C^3CPS are as follows:

1. The C^3CPS could replace or compliment other aging and increasingly vulnerable "command, communications, and control" command centers currently configured underground, on aircraft, and in land mobile caravans. It would offer very capable alternatives to the shortcomings of land, sea, and air assets described earlier and represented in Figure 3.

2. In time of war or national emergency, when military and civilian communities may be isolated from each other due to C^3 networks being severed, the C^3CPS communication technicians would verify and coordinate the reconnection of communications paths among pockets of surviving communities. Continuity of essential government functions and real-time emergency

support to nuclear commanders in chief would be supported quickly by deploying satellites spares from the C^3CPS to provide a minimum essential emergency communications network.

3. Other missions designed to improve worldwide national surveillance, communications, or navigation could also be performed on the C^3CPS.

4. With the weightlessness and vastness of space, modular additions can be easily added to the C^3CPS as technology and advanced capabilities mature. Unlike the confinement and weight restrictions posed by airframes, "caves," hulls of ships, and caravans, space does not penalize engineers for added weight or cubic dimensions. Once in orbit, weight and size mean very little.

A C^3CPS would benefit the military instrument of national power immeasurably. In an environment where this type of thinking was routinely ignored, Secretary of the Air Force "Pete" Aldridge and Air Force Chief of Staff General Larry Welch recently announced the tenets of a revamped space policy. First, "Spacepower will be as decisive in future combat as airpower is today." Second, "We must be prepared for the evolution of spacepower from combat support to the full spectrum of

military capabilities" (31:20). With that new encouragement, the time is ripe for visionary space thought. The C^3CPS concept offers alot to think about.

CHAPTER VI

CONCLUSION

When a United States congressman says ". . . U.S. forces are at the brink of being out of control," he gets your attention. Upon investigation, today's military forces are controlled through a complex infrastructure of C^3 systems designed to provide our national leaders with the best possible command and control capabilities. Our land, sea, and airborne C^3 systems are all ultimately Earth-based, however, and thus growing in vulnerability.

Through an adopted national security strategy of permanently manning a C^3CPS with designated NCA representatives, United States leadership and C^3 capability to our military forces would be significantly improved. The survivability features offered to the NCA and this nation by a C^3CPS will help ensure that United States military forces are never out of control.

A C^3CPS represents a commitment to national security and leadership in space for the future. Its concept and potential benefits help substantiate a need for full-time manned missions in space for national security purposes. The decision to deploy a C^3CPS would benefit United States security strategy through

significant enhancements to nuclear deterrence and the political, economic, psychological, and military instruments of national power.

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GLOSSARY

ABM	Anti-Ballistic Missile.
C^2 (CC)	Command and Control.
C^3 (CCC)	Command, Control, and Communications.
C^3I (CCCI)	Command, Control, Communications, and Intelligence.
C^3CPS (CCCCPS)	Command, Control, and Communications Command Post in Space.
DOD	Department of Defense.
EMP	Electromagnetic Pulse. High-intensity electromagnetic radiation generated by a nuclear blast above the Earth's surface that will disrupt electronic and electrical systems.
ICBM	Intercontinental Ballistic Missile.
JCS	Joint Chiefs of Staff.
LOS	Line of Sight.
Minutemen	Intercontinental Ballistic Missiles that belong to the U.S..
NASA	National Aeronautics and Space Administration.
NATO	North Atlantic Treaty Organization.
NCA	National Command Authorities. A designation for the President and Secretary of Defense of the United States of America.
TRIAD	Commonly used euphemism for the combined U.S. strategic forces comprised of intercontinental ballistic missiles, submarine-launched ballistic missiles, and airbreathing bombers.
U & S Commanders	Unified and Specified Commanders are responsible for deploying and employing U.S. military forces under their command in the most effective way.